

CLAIMS

1. A valve pin actuating mechanism for an injection molding apparatus,
the injection molding apparatus including at least one melt channel and a
5 valve pin that is movable in the melt channel, the valve pin actuating
mechanism including:
 - an actuator;
 - a linkage element having a mechanically upstream connector and a
mechanically downstream connector, wherein the linkage element is
10 connected at least indirectly to the actuator at the mechanically upstream
connector and wherein the linkage element is connected at least indirectly to
the valve pin at the mechanically downstream connector, and wherein the
linkage element is rotatable by actuation of the actuator; and
 - a stop, wherein the stop is configured to engage a limit surface to limit
15 the angle of rotation of the linkage element, and wherein the stop and the limit
surface are configured to engage mechanically upstream from the
downstream connector.
2. A valve pin actuating mechanism as claimed in claim 1, wherein the
20 stop is positioned on the linkage element.
3. A valve pin actuating mechanism as claimed in claim 1, wherein the
stop is integrally formed in the linkage element.
- 25 4. A valve pin actuating mechanism as claimed in claim 1, wherein the
melt channel is defined in a hot runner nozzle, and the stop is positioned on
the hot runner nozzle.
5. A valve pin actuating mechanism as claimed in claim 1, wherein the
30 stop is adjustable to permit adjustment of the angle of rotation of the linkage
element at which the stop engages the limit surface.

6. A valve pin actuating mechanism as claimed in claim 5, wherein the stop is threaded and is received in a threaded aperture.

7. A valve pin actuating mechanism as claimed in claim 6, wherein the stop has an engagement surface thereon for engaging the limit surface and wherein one of the engagement surface and the limit surface is domed.

8. A valve pin actuating mechanism as claimed in claim 1, wherein the linkage element is rotatable in a plane of rotation, and wherein the stop has an engagement surface thereon for engaging the limit surface, and wherein one of the engagement surface and the limit surface is arcuate in a plane that is at least parallel to the plane of rotation.

9. A valve pin actuating mechanism as claimed in claim 8, wherein the arcuate surface is non-arcuate in a direction that is perpendicular to the plane of rotation, and wherein the other of the engagement surface and the limit surface is planar.

10. A valve pin actuating mechanism for an injection molding apparatus, the injection molding apparatus including at least one melt channel and a valve pin that is movable in the melt channel, the valve pin actuating mechanism comprising:

a valve pin guiding element for connection to the valve pin and for guiding the valve pin along a line of travel, the valve pin guiding element having first and second generally opposed receiving surfaces, wherein the first and second generally opposed receiving surfaces are substantially perpendicular to the line of travel;

a linkage element, the linkage element having a mechanically upstream connector and a mechanically downstream connector, wherein at the mechanically downstream connector the linkage element has first and second arms for engaging the first and second receiving surfaces, wherein rotation of the linkage element causes movement of the valve pin along the line of travel;

an actuator, wherein the actuator is mechanically upstream of the linkage element and is connected at least indirectly to the mechanically upstream connector of the linkage element for rotating the linkage element; and

- 5 a stop, wherein the stop is configured to engage a limit surface to limit the angle of rotation of the linkage element, and wherein the stop and the limit surface are configured to engage mechanically upstream from the first and second arms.